

REMARKS

Claims 1, 3-12, 13-32, 34-38, and 40-46 remain in this application with claims 1 and 32 in independent form. Claims 1, 12, 32, 38, 45, and 46 have been amended. Claims 2, 13, 15, 33, and 39 have been cancelled.

Applicant is submitting a petition for a one-month extension of time which is accompanied by the fee required under 37 C.F.R. §1.17(a)(1). The mailing date of the Office Action was July 13, 2005 and the three-month response date was October 13, 2005. The petition seeks to extend the period for reply to November 13, 2005 and the subject amendment is being filed during this extended period.

The specification stands rejected under 35 U.S.C. §132(a) because it is contended that new matter was introduced into the disclosure. Applicant has amended paragraph [0029] to be consistent in scope with the specification as originally filed. Specifically, the chain extender has a hydroxyl number of from about 448 to about 4,488 mg KOH/g.

In paragraph [0029], the chain extender is described as having a molecular weight of less than 1000, preferably from 25 to 250, and more preferably less than 100. Further, in paragraph [0030], the chain extender is described as having two isocyanate reactive groups. With knowledge of the molecular weight and the functionality for the chain extender, a person of ordinary skill in the art, relying on a well-known mathematical formulation can easily deduce the hydroxyl number that is now incorporated into the specification.

As well known to those skilled in the art, the functionality and molecular weight of a polyol can be used to determine the hydroxyl number in accordance with the

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following formula:

$$MolecularWeight = \frac{56,100 * f}{OH\#}$$

where f is the functionality of the polyol; and
 $OH\#$ is the hydroxyl number (mg KOH/g).

The preferred molecular weight of the chain extender is from 25 to 250. The corresponding hydroxyl numbers can be calculated using the above formula. At a molecular weight of 25 and a functionality of 2, the hydroxyl number is $(56,100*2)/25$, or **4,488 mg KOH/g**. At a molecular weight of 250 and a functionality of 2, the hydroxyl number is $(56,100*2)/250$, or **448.8 mg KOH/g**. Therefore, the hydroxyl number is from about **448 to about 4,488 mg KOH/g**. Applicant submits that the disclosure of the molecular weight and the functionality in the specification as originally filed fully support the hydroxyl number of from about 448 to about 4,488 mg KOH/g. Accordingly, no new matter has been introduced.

Claims 1-12, 13-38, and 40-46 stand rejected under 35 U.S.C. §112, first paragraph. Applicant has amended claims 1 and 32 to recite that the chain extender has two isocyanate-reactive groups as suggested by the Examiner. As such, the §112 rejection is believed to be overcome.

Claims 1-12, 14-38, and 40-46 stand rejected under 35 U.S.C. §102(b) as being anticipated by Bleys (United States Patent No. 5,968,993) and under 35 U.S.C. §102(e) as being anticipated by Hager et al. (United States Patent No. 6,391,935).

Applicant has amended independent claims 1 and 32 and the §102 rejections are believed to be overcome. Specifically, Bleys and Hager et al. do not disclose, either expressly or inherently, each and every feature as claimed.

Independent claims 1 and 32 each require an isocyanate-reactive blend that comprises a first isocyanate-reactive component having at least two isocyanate-reactive groups and a second isocyanate-reactive component having at least three isocyanate-reactive groups. The first isocyanate-reactive component is used in an amount of from 40 to 75 parts by weight and the second isocyanate-reactive component is used in an amount of from 25 to 60 parts by weight, both based on 100 parts by weight of the isocyanate-reactive blend.

The a first isocyanate-reactive component has a weight-average molecular weight of from 2500 to 4500, a hydroxyl number of from 30 to 50, and comprises at least 60 parts by weight of ethylene oxide based on 100 parts by weight of the first isocyanate-reactive component. The second isocyanate-reactive component has a weight-average molecular weight of from 1000 to 6000, a hydroxyl number of from 20 to 500, and comprises at most 30 parts by weight of ethylene oxide based on 100 parts by weight of the flexible isocyanate-reactive component.

As described in the specification as originally filed in paragraphs [0013], [0014], [0028], and [0043], the subject invention provides a viscoelastic foam that is flame retardant, while being substantially free of flame retardants. It is believed that this flame retardancy results from the particular type and amounts of the first and the second isocyanate-reactive components present in the blend. Moreover, the flame retardancy is achieved because the specific first isocyanate-reactive component is hydrophilic and the second isocyanate-reactive component is hydrophobic.

Neither Bleys or Hager et al. disclose the novel and unique combination of the first and the second isocyanate-reactive components, as claimed. Bleys only discloses a polyol blend having an average oxyethylene content of between 50 and 85 weight

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percent. The examples of Bleys disclose elastomers formed individually from a Polyol A, a Polyol B, and a Polyol C, i.e., no blends of Polyols A, B, or C. Polyol A is a polyether triol having random oxyethylene (EO) and oxypropylene (PO) residues with a 76% oxyethylene content and OH-value of 42 mg KOH/g. Polyol B is EO/PO triol having 10% EO-tip and OH-value of 36 mg KOH/g. Polyol C is a EO/PO diol having 75% random EO-groups and MW=4000. Accordingly, Bleys does not disclose the novel and unique isocyanate-reactive blend as claimed.

Similarly, Hager et al. only discloses an isocyanate-reactive mixture that includes a monol and a polyol. The polyol has an equivalent weight of less than 600 and a hydroxyl number of greater than 94. The polyol can be PO homopolymers, block EO copolymers, EO-capped polyoxypropylenes, random EO/PO copolymers, and PO polymers tipped with EO/PO mixture. Referring to Examples 6 and 19, the isocyanate-reactive mixture includes two polyols P1 and P4. P1 is made by propoxylating glycerine and has a hydroxyl number of 168 and P4 is also made by propoxylating glycerine and has a hydroxyl number of 112. However, the polyols do not satisfy the limitations of the first and the second isocyanate reactive components and the mixture does not satisfy the each every limitation of the isocyanate-reactive blend.

In view of the above, the §102(b) rejection over Bleys and the §102(e) rejection over Hager et al. are believed to be overcome and claims 1 and 32 are believed to be allowable. Claims 3-12, 13-31, 34-38, and 40-46, which depend directly or indirectly from claims 1 and 32, are also believed to be allowable.

Claims 1-12, 14-38, and 40-46 stand rejected under 35 U.S.C. §102(b) as being anticipated by Lutter et al. (United States Patent No. 5,420,170). The Examiner states that Lutter et al. discloses preparations of polyurethane foams prepared from isocyanates,

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polyols, and chain extenders and having densities as claimed. The Examiner also contends that even though the glass transition temperatures and tan peak deltas are not disclosed, they are inherent owing to the similarities in the material employed in the products.

Claims 1 and 32 have been amended as discussed above to more clearly define the novelty and uniqueness of the subject invention. Specifically, claim 1 and 32 have been amended to recite that the first isocyanate-reactive component has at least two isocyanate-reactive components and the second isocyanate-reactive component has at least three isocyanate-reactive components. The specific isocyanate-reactive blend claimed in claims 1 and 32 is not disclosed in Lutter et al. Additionally, Lutter et al. discloses incorporating a flame retardant to make the viscoelastic polyurethane foam flame retardant. As discussed above, the subject invention achieves flame retardancy as a result of the specific isocyanate-reactive blend as claimed.

To the contrary, Lutter et al. is merely directed toward a viscoelastic polyurethane that is used for structure-borne soundproofing. Lutter et al. does disclose using a chain extender broadly in an amount of from 1 to 60 parts by weight, preferably from 1 to 10 parts by weight (*see col. 9, lines 15-20*). In Example 3, the chain extender is ethylene glycol and is present in an amount of 2.8 parts by weight. Examples 5 to 8 use the chain extender in an amount of 6 parts by weight.

The Applicant further submits that Lutter et al. does not disclose the claimed subject matter with sufficient specificity to constitute an anticipation under 35 U.S.C. §102. Referring to the Manual of Patent Examining Procedure (MPEP) 2131.03(II), whether or not the prior reference discloses the claimed subject matter with sufficient specificity is fact dependent. *Where the claim terms recite a property or intended use*

distinguishable from the prior art, an anticipation rejection may not be appropriate.

See In re Pearson, 494 F.2d 1399, 1403, 181 U.S.P.Q. 641, 644 (C.C.P.A. 1974) (explaining that "such terms must define, indirectly at least, some characteristic not found in the old composition"). *See also E.I. Du Pont de Nemours & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430, 1435, 7 U.S.P.Q.2d 1129, 1133 (Fed. Cir. 1988) (noting that "[o]n occasion, particularly with polymers, structure alone may be inadequate to define the invention, making it appropriate to define the invention in part by property limitations").

Claims 1 and 32 have been amended to recite that the chain extender is used in the amount from **7 to 50 parts by weight**. Varying the amount of the chain extender allows a glass transition temperature of the foam to be adjusted to correspond to a use temperature of the foam. There is full support in the specification as originally filed for this amendment and no new matter is believed to be added. In other words, the viscoelastic polyurethane foams of the subject invention have a glass transition temperature that corresponds with a use temperature of the foam. As discussed in paragraph [0032] of the specification as originally filed, the glass transition temperature can be adjusted by adjusting the amount of the chain extender to more closely correspond with the use temperature.

Viscoelastic polyurethane foams have unique viscoelastic characteristics. As discussed in the section titled "Background of the Invention" of the specification as originally filed, viscoelastic polyurethane foams have a hard segment phase and a soft segment phase and the viscoelasticity is maximized when the soft segment phase undergoes vitrification. To date, the glass transition temperature in prior art viscoelastic polyurethane foams has been modified by manipulating the structure and composition of

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the soft segment phase by having different isocyanate-reactive components for different glass transition temperatures.

When such viscoelastic polyurethane foams are used in a mattress or as a seat cushion, body heat from a user warms a portion of the foam, thus softening it. The result is that the cushion molds to the shape of the body part in contact with it increasing comfort and the remainder of the foam remains hard providing support. Thus, in cold climates, the use temperature is lower and therefore the glass transition temperature should be lower and vice versa when the use temperature is higher. Undesirable results for viscoelastic polyurethane foam occur if the use temperature does not correspond with the glass transition temperature. If the use temperature is low and the glass transition temperature is high, then large amounts of heat from the user is required to soften the viscoelastic polyurethane foam. In extreme cases, such as in a very cold climate, the user may be unable to sufficiently warm the viscoelastic polyurethane foam and will be sitting on a cold, hard block of viscoelastic polyurethane foam.

The subject invention is able to adjust the glass transition temperature by adjusting the hard segment phase by incorporating the chain extender, while employing standard viscoelastic isocyanate-reactive components. Said another way, instead of developing many different isocyanate-reactive components to produce many different viscoelastic polyurethane foams each having a unique glass transition temperature, the subject invention can produce the unique glass transition temperature from the same isocyanate-reactive component by varying and adjusting the amount of the chain extender.

It is believed that Lutter et al. do not disclose the claimed subject matter with the sufficient specificity required by the MPEP to constitute an anticipation for the following reasons. First, Lutter et al. does not disclose the glass transition temperature of the

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viscoelastic polyurethane foam. Second, Lutter et al. does not vary or adjust the amount of the chain extender to adjust the glass transition temperature of the viscoelastic polyurethane foam to correspond to the use temperature. Third, Lutter et al. does not disclose specific examples failing with the claimed ranges of the chain extender to provide the adjusted glass transition temperature.

Lutter et al. discloses the viscoelastic polyurethane foam being used for soundproofing and the glass transition temperature is not disclosed. The glass transition temperature is inconsequential when the viscoelastic polyurethane foam is used for soundproofing. Since a user is not warming the viscoelastic polyurethane foam and the viscoelastic polyurethane foam is not supporting the user, the viscoelastic characteristics of the viscoelastic polyurethane foam are not being relied upon. Lutter et al. only discloses that the viscoelastic polyurethane foam can be used within a temperature range of from -20 °C to 80 °C. Even though Lutter et al. discloses a broad range for the amount of the chain extender being used, there is no disclosure of the chain extender being used in various amounts to adjust the glass transition temperature to correspond with the use temperature.

In summary, Lutter et al. does not disclose specific examples of the chain extender falling within the claimed ranges. Further, Lutter et al. do not disclose, teach, or suggest the novel and unique limitation of adjusting the amount of the chain extender to produce the viscoelastic polyurethane foam having a glass transition temperature that corresponds to the use temperature of the foam.

As set forth in MPEP 2131.03(II), "When the prior art discloses a range which touches, overlaps or is within the claimed range, but no specific examples falling within the claimed range are disclosed, a case by case determination must be made as to

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anticipation.” Since, claims 1 and 32 have been amended to recite that the chain extender is used in the amount from 7 to 50 parts by weight and specific examples falling within such a range are not disclosed in Lutter et al., it is respectfully submitted that the 35 U.S.C. §102(b) rejection is overcome and claims 1 and 32 are believed to be allowable. Claims 3-12, 13-31, 34-38, and 40-46, which depend directly or indirectly from claims 1 and 32, are also believed to be allowable.

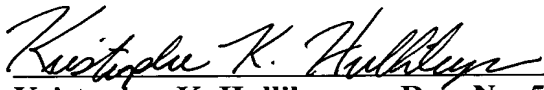
A *Petition For Extension of Time Under 37 CFR 1.136(a)* is also being filed concurrently herewith.

Accordingly, it is respectfully submitted that the Application, as amended, is now presented in condition for allowance, which allowance is respectfully solicited.

Respectfully submitted

HOWARD & HOWARD ATTORNEYS, P.C.

October 27, 2005
Date

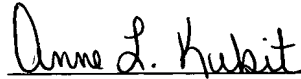

Kristopher K. Hulliberger, Reg. No. 53,047
The Pinehurst Office Center, Suite #101
39400 Woodward Avenue
Bloomfield Hills, Michigan 48304
(248) 723-0453

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CERTIFICATE OF MAILING

I hereby certify that this **Amendment** for United States Patent Application Serial Number **10/607,555** filed **June 26, 2003** is being deposited with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450 on **October 27, 2005**.



Anne L. Kubit

KKH/alk